

Family physician and obstetrician episiotomy rates in low-risk obstetrics in southern Alberta

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Abstract

Objective To examine the episiotomy rate for women delivering in a regional hospital versus the rate in rural hospitals.

Design Retrospective review of low-risk delivery charts for a 12-month period (2006 to 2007).

Setting One regional and 3 rural hospitals in southern Alberta.

Participants Charts were reviewed for a random sample of 10% of the women with low-risk deliveries at the regional hospital, and all such women at the participating rural hospitals. Eligible women were nulliparous or multiparous, were at 37 or more weeks' gestation, and delivered live newborns vaginally, including spontaneous and assisted vaginal deliveries. Low-risk deliveries were defined by the absence of high-risk maternal, prenatal, and perinatal features.

Main outcome measures Details of the delivery, including use of episiotomy.

Results Charts were reviewed for 115 women who delivered in the regional hospital and for 140 women from the rural hospitals. Maternal and infant characteristics did not differ between settings (mean age 26 years, median parity 1, mean birth weight 3433 g [regional] and 3462 g [rural], and mean head circumference 35 cm). Episiotomies were performed in 13% of regional and 4% of rural deliveries ($P=.01$). Perineal tears occurred in 65% of regional (3 with third- to fourth-degree tears) and 57% of rural (2 with third- to fourth-degree tears) deliveries ($P=.20$). Deliveries were carried out by 12 FPs and 6 obstetricians in the regional centre, and by 19 FPs in the rural hospitals.

Conclusion In our study, both rural and regional practitioners in southern Alberta demonstrated a "restrictive" use of episiotomy, in keeping with current evidence-based guidelines. Further prospective research is needed to examine how physician, maternal, and pregnancy characteristics affect episiotomy and perineal tear rates.

EDITOR'S KEY POINTS

- Current guidelines discourage the practice of routine episiotomy because episiotomy increases the incidence of third- and fourth-degree perineal tears. Research suggests that episiotomy rates vary among sites, and that obstetricians are more likely than FPs to perform episiotomy in similar patients.
- The goal of this study was to examine whether low-risk patients delivering in a regional hospital in southern Alberta were less likely to undergo episiotomy than those in rural hospitals.
- Following a chart review of deliveries in rural and regional settings, this study found that patients were less likely to undergo episiotomy in the rural settings or if an obstetrician was not in attendance at a regional delivery. Rural and regional FPs had equivalent episiotomy rates.

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Taux des épisiotomies pratiquées par les médecins de famille et les obstétriciens dans les cas obstétricaux à faible risque dans le sud de l'Alberta

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Résumé

Objectif Établir le taux des épisiotomies chez des patientes qui accouchent dans un hôpital régional par rapport à des hôpitaux ruraux.

Type d'étude Revue rétrospective de dossiers d'accouchements à faible risque sur une période de 12 mois (2006 à 2007).

Contexte Un hôpital régional et 3 hôpitaux ruraux du sud de l'Alberta.

Participants On a révisé les dossiers d'un échantillon aléatoire de 10% des femmes ayant eu des accouchements à faible risque à l'hôpital régional et de toutes celles des hôpitaux ruraux participants. Les femmes admissibles étaient nullipares ou multipares; elles avaient des grossesses d'au moins 37 semaines et ont accouché de nouveau-nés vivants, par voie vaginale. Les accouchements à faible risque ne devaient pas présenter de risque élevé sur les plans maternel, prénatal et périnatal.

Principaux paramètres à l'étude Détails de l'accouchement, incluant le recours à l'épisiotomie.

Résultats On a révisé les dossiers de 115 femmes qui avaient accouché à l'hôpital régional et de 140 femmes des hôpitaux ruraux. Les caractéristiques des mères et des nourrissons ne différaient pas d'un milieu à l'autre (âge moyen: 26 ans; parité médiane : 1; poids de naissance: 3433 g [régional] et 3462 g [ruraux]; et circonférence moyenne de la tête: 35 cm). Des épisiotomies ont été effectuées dans 13% des accouchements régionaux et dans 4% des accouchements ruraux ($P=,01$). Des déchirures périnéales sont survenues dans 65% des accouchements régionaux (dont 3 du troisième ou du quatrième degré) et dans 57% des accouchements ruraux (dont 2 du troisième ou quatrième degré) ($P=,20$). Les accouchements ont été effectués par 12 MF et 6 obstétriciens au centre régional et par 19 MF dans les hôpitaux ruraux.

Conclusion Dans cette étude, les médecins ruraux et régionaux du sud de l'Alberta ont tous fait un usage restrictif de l'épisiotomie, conformément aux directives actuelles fondées sur des données probantes. Il faudra davantage d'études pour déterminer comment les caractéristiques du médecin, de la mère et de la grossesse affectent le taux d'épisiotomie et de déchirures périnéales.

POINTS DE REPÈRE DU RÉDACTEUR

- Les directives actuelles découragent le recours routinier à l'épisiotomie parce que cela augmente l'incidence des déchirures périnéales des troisième ou quatrième degrés. Les recherches suggèrent que les taux d'épisiotomie varient d'un endroit à un autre et que les obstétriciens sont plus susceptibles que les MF d'en effectuer en présence de cas semblables.
- Cette étude voulait savoir si les patientes à faible risque qui accouchent dans un hôpital régional du sud de l'Alberta sont moins susceptibles d'avoir une épisiotomie que celles qui accouchent dans un hôpital rural.
- Une revue de dossiers d'accouchements en milieux ruraux et régionaux a montré que les patientes étaient moins susceptibles d'avoir une épisiotomie en milieu rural, ou encore dans un hôpital régional lorsqu'il n'y avait pas d'obstétricien disponible. Les MF ruraux et régionaux avaient des taux équivalents d'épisiotomie.

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Vaginal tears frequently occur in the course of normal childbirth. In the past century, episiotomy was practised throughout the world, with rates ranging between 9.7% and 100%,¹ and with varied intents (eg, to reduce the number of third- and fourth-degree perineal tears and to expedite vaginal delivery).² It was also believed that the surgical incision might heal more quickly, with less pain and lower infection rates than a spontaneous perineal tear.² Current evidence shows that episiotomy increases the risk of a third- or fourth-degree perineal tear, wound infection,³⁻⁵ and postpartum hemorrhage,⁶ without decreasing long-term complications, such as perineal pain or urinary incontinence.^{7,8} Delivery without episiotomy has a higher risk of anterior lacerations.⁴ Current guidelines discourage routine practice of episiotomy,^{4,9} including with instrumented delivery.^{10,11}

In Canada, episiotomy rates declined from 37.7% in 1993¹² to 23.8% in 2001.¹ Rates in Alberta were 20.1% in 2000 and 15.5% in 2004.¹³ Rates vary among hospitals and among providers.¹⁴⁻¹⁶ Obstetricians (OBs) are more likely to perform episiotomy than FPs are, adjusting for use of forceps.¹⁷ Low-volume FPs (fewer than 25 deliveries per year) perform episiotomy more frequently than high-volume FPs do.¹⁸ Most low-volume FPs in Alberta practise in rural centres.^{18,19}

The decision to perform episiotomy might be influenced by several factors, including nonreassuring fetal status, instrumented delivery, and practitioner training and preference. Rural centres do not generally have immediate cesarean capabilities or OB consultations. In the case of suspected fetal compromise, an episiotomy might be favoured to hasten delivery. Our study examined whether low-risk patients delivering in a regional hospital in southern Alberta were less likely to undergo episiotomy than those in rural hospitals.

METHODS

Study design

This retrospective paper chart review included low-risk delivery records in southern Alberta from 3 rural hospitals and a random sample from 1 regional hospital. Eligible deliveries occurred between April 1, 2006, and March 31, 2007.

Eligible women were parous (pregnant with their first or subsequent viable offspring), were at or beyond 37 weeks' gestational age, and delivered live newborns vaginally. Deliveries occurred in hospital and were attended by medical doctors. Low-risk deliveries were defined by the absence of high-risk maternal, prenatal, and perinatal features. Exclusion criteria were

the following: multiple gestation, breech presentation, pre-existing maternal diabetes, gestational diabetes, pre-existing or gestational hypertension, preeclampsia, previous cesarean section, infants small for gestational age, and any other severe maternal medical condition that might predispose a patient to being cared for in a regional centre.

Data collection

Data were collected manually from all eligible delivery records by the investigators (K.P. and A.H.) and entered directly into an Excel spreadsheet (version 1997 to 2003). Information collected included maternal and infant data, delivery details, intrapartum and antepartum risk scores, and physician training. Subject and delivery provider privacy were maintained by using unique study identifiers.

Sample

A sample size calculation determined that 100 charts were needed from the regional and rural groups to identify an absolute difference of 20% or more in episiotomy rate, for example a difference of 15% and 35% between groups (power 90%, $P=.05$).

To achieve this sample, a random selection of 10% of eligible charts from the regional hospital was identified electronically by the Health Records Department. All charts of eligible patients from the rural sites were included.

Data analysis

Statistical analyses compared regional and rural settings. Data were analyzed using STATA software, version 11. Appropriate descriptive statistics were calculated for all data items: for example, mean and standard deviation for maternal age, and numbers and percentages for categorical variables. Comparisons of baseline sample characteristics between rural and regional deliveries used χ^2 , Mann-Whitney, or t tests as appropriate. The χ^2 test was used to compare episiotomy rates, the primary outcome, between groups. Potential confounding or modifying effects of provider specialty (FP vs OB), epidural, time and day of week, parity, infant birth weight, and instrumental delivery were examined using a generalized linear model for the binomial distribution with a log link (log-binomial regression). Physician training and experience were compared between regional and rural settings using t or χ^2 tests, as appropriate.

Ethics approval

The study was approved by the University of Calgary Conjoint Health Research Ethics Board and the Alberta Health Services Office of Medical Bioethics. Patient consent was obtained to collect chart data.

RESULTS

A total of 255 low-risk delivery records were studied: 115 regional deliveries and 140 rural deliveries.

Maternal and infant characteristics

Differences in maternal and infant characteristics were not statistically significant between locations of delivery (Table 1).

Delivery characteristics

There were fewer inductions or augmentations performed regionally (33% vs 66%, $P < .01$). Epidurals were administered in more regional deliveries (37% vs 19%, $P = .02$). Nonreassuring fetal status was reported in 27% of regional deliveries, compared with 10% of rural deliveries ($P < .01$). Other characteristics of the delivery were not statistically different between groups (Table 2).

Episiotomies were performed in 15 (13%) regional deliveries and in 6 (4%) rural deliveries (relative risk [RR] 3.0, 95% confidence interval [CI] 1.2 to 7.6, $P = .01$). All rural episiotomies were performed by FPs. In the regional sample, OBs performed 14 of the 15 episiotomies (93%) and performed 68 of the 115 deliveries (59%). Family physicians were 0.18 times as likely to perform episiotomies as OBs were (4% vs 21%; RR 0.18, 95% CI 0.08 to 0.43, $P < .01$). Nonreassuring fetal status was reported in 9 of 15 (60%) regional deliveries with episiotomy, and in 1 of 6 (17%) rural episiotomies. An instrumented delivery was performed in 10 of 15 (67%) regional deliveries with episiotomy, and 3 of 6 (50%) rural deliveries with episiotomy. The instrumentation rate was similar between FPs (12%) and OBs (18%) (RR 0.67, 95% CI 0.35 to 1.27, $P = .22$). When considering only deliveries by FPs, episiotomy was performed in 1 of 47 (2%) regional deliveries and 6 of 140 (4%) rural deliveries (RR 0.50, 95% CI 0.06 to 4.0, $P = .51$). When adjusting for maternal epidural, time and day of week, parity, infant birth weight, and instrument-assisted delivery, the regional and rural FPs maintained

episiotomy rates that were not statistically different (RR 0.47, 95% CI 0.06 to 3.9, $P = .49$).

Provider characteristics

The regional sample included deliveries by 12 FPs and 6 OBs. A sample of 10% of eligible deliveries in the study period constituted the regional sample; therefore, rate estimates were scaled by a factor of 10 to estimate the actual annual delivery rate for regional providers. Of the 115 regional deliveries in the 10% sample, 68 (59%) were performed by OBs and 57 (41%) were performed by FPs. Regional OBs in the sample performed an average of 113 (range 20 to 220) deliveries per annum, and regional FPs in the sample performed an average of 39 (range 10 to 110) deliveries per annum ($P = .04$). The rural deliveries were undertaken by 19 FPs. Among the rural FPs, the average number of deliveries per year was 7 (range of 2 to 26), much fewer than regional FPs ($P = .01$).

In the regional site, 94% of doctors were trained in Canada compared with 53% in the rural centres ($P = .02$). Other differences of provider characteristics were not statistically significant between groups (Table 3).

DISCUSSION

Our research in southern Alberta found that low-risk delivery patients were more likely ($P < .01$) to undergo episiotomy in the regional study hospital (13%) than in the rural hospitals included (4%). Despite decreased accessibility to cesarean section and no specialist obstetric or pediatric support—factors which we thought might predispose a rural practitioner to performing episiotomy in an effort to hasten delivery—our study shows that rural FPs performed episiotomy less frequently than regional practitioners did in these study settings.

Episiotomy rates in both southern Alberta settings were lower than the most recent published national (23.8% in 2001 and 20.7% in 2006)^{1,20} and provincial (15.5% in 2004)¹³ statistics, although the regional centre episiotomy rate of 13% was similar to the rate of

Table 1. Patient characteristics by location of delivery

CHARACTERISTIC	REGIONAL DELIVERIES (N = 115)	RURAL DELIVERIES (N = 140)	P VALUE	ANALYSIS METHOD
Maternal				
• Mean (SD) maternal age, y	26 (5)	26 (5)	.57	<i>t</i> test
• Median (IQR) gravity	2 (1-4)	3 (2-4)	.39	Mann-Whitney <i>U</i>
• Median (IQR) parity	1 (0-2)	1 (0-2)	.10	Mann-Whitney <i>U</i>
• No. (%) nulliparous	39 (34)	40 (29)	.36	χ^2 test
Infant				
• Mean (SD) birth weight, g	3433 (467)	3462 (462)	.61	<i>t</i> test
• Mean (SD) head circumference, cm	35 (1.4)	35 (1.4)	.33	<i>t</i> test

IQR—interquartile range.

Table 2. Delivery characteristics by location of delivery

CHARACTERISTIC	REGIONAL DELIVERIES (N = 115)	RURAL DELIVERIES (N = 140)	P VALUE	ANALYSIS METHOD
Provider, n (%)			NA	NA
• Obstetrician	68 (59)	0 (0)		
• Family physician	57 (41)	140 (100)		
Weekday, n (%)	92 (80)	105 (75)	.34	χ^2 test
Daytime (7:30–17:00), n (%)	53 (46)	57 (41)	.39	χ^2 test
Median (IQR) antenatal risk score	0 (0–2)	1 (0–2)*	.11	Mann-Whitney <i>U</i>
Median (IQR) intrapartum risk score	0 (0–1)	0 (0–0)*	.04	Mann-Whitney <i>U</i>
Median (IQR) duration of stage, min				
• First stage	364 (180–455)	390 (197–540)	.13	Mann-Whitney <i>U</i>
• Second stage	17 (6–37)	18 (8–51)*	.24	Mann-Whitney <i>U</i>
Induction or augmentation, n (%)	38 (33)	92 (66)	<.01	χ^2 test
Nonreassuring fetal status, n (%)	31 (27) [†]	14 (10) [†]	<.01	χ^2 test
Analgesia, n (%)			<.01	χ^2 test
• None	73 (65)	83 (67)		
• Local alone	33 (29)	3 (2)		
• Narcotic with or without other analgesia	7 (6)	19 (15)		
• Inhaled analgesia with or without other analgesia	0 (0)*	19 (15) [§]		
Epidural	42 (37)	27 (19)	.02	χ^2 test
Instrumentation, n (%)			.05	χ^2 test
• Forceps	8 (7)	13 (9)		
• Vacuum	10 (9)	4 (3)		
Episiotomy	15 (13)	6 (4)	.01	χ^2 test
Perineal tears			.20	χ^2 test
• None	36 (35)	57 (43)		
• Any	68 (65) [¶]	76 (57) [#]		

NA—not applicable.

*Missing data for 35 women.

†Missing data for 1 woman.

‡Missing data for 2 women.

§Missing data for 16 women.

||Includes 3 women in the regional group and 2 women in the rural group with third- or fourth-degree tears.

¶Missing data for 11 women.

#Missing data for 7 women.

12.9% reported in the Maternity Experiences Survey for Alberta.²⁰ Available literature on low-risk deliveries from 1997 to 1998 shows similar episiotomy rates to the national and provincial data: episiotomy rates for low-risk deliveries in Alberta were 19.2% for low-volume and 17.3% for high-volume FP delivery providers,¹⁸ while a study of deliveries in one Canadian hospital found rates of 22.7% and 19.1%.¹⁹ The 1997 publication of the first Cochrane review that recommended against routine episiotomy⁴ might help account for the low episiotomy rates observed in our study of centres in southern Alberta (13% for

regional and 4% for rural deliveries) compared with earlier studies.^{1,13} The 2004 Society of Obstetricians and Gynaecologists of Canada Guideline on Operative Vaginal Birth also discouraged routine episiotomy even with instrumented delivery.⁹

On subgroup analysis, our data showed that episiotomy rates of regional FPs did not differ significantly from those of their rural counterparts (2% vs 4%, $P = .51$). The episiotomy rate for women treated by regional OBs (21%), however, does compare with the national^{1,20} and provincial averages.¹³ The higher episiotomy rate among OBs cannot be

Table 3. Physician training and experience

CHARACTERISTIC	REGIONAL PHYSICIANS (N = 18), N (%)	RURAL PHYSICIANS (N = 19), N (%)	P VALUE	ANALYSIS METHOD
Specialist			.02	χ^2 test*
• Obstetrician	6 (33)	0		
• Family physician	12 (66)	19 (100)		
Training			.02	χ^2 test*
• Canadian	16 (94)	10 (53)		
• Other	1 (6) [†]	9 (47)		
Years in practice			.91	χ^2 test
• <20	12 (71)	12 (63)		
• ≥20	5 (29) [†]	7 (37)		
Carry out episiotomy			.10	χ^2 test*
• None	11 (61)	17 (90)		
• ≥1	7 (39)	2 (10)		

*Continuity was corrected.

[†]Missing data for 1 woman.

attributed to instrumentation in our study, as rates did not differ between FPs and OBs, in contrast to studies that show correlation of higher episiotomy rates with instrumentation and higher instrumentation rates by OBs.^{16,17}

Another finding that differed significantly between regional and rural deliveries was the rate of epidural analgesia (37% regional vs 19% rural, $P=.02$). This was not unexpected, as more anesthetists are available in the regional site to provide the services. We were surprised that fewer inductions or augmentations were performed regionally (33% vs 66% rural, $P<.01$), and that nonreassuring fetal status was recorded more frequently in the regional hospital (27% vs 10% of rural deliveries, $P<.01$). Unfortunately the information we collected from the charts was insufficiently detailed to enable us to identify the reason for either of these differences.

Strengths of this research include that all low-risk vaginal deliveries at rural sites were reviewed. Patients delivering in regional and rural settings did not appear to differ in maternal and infant demographic characteristics, suggesting that the regional sample was indeed comparable to the rural population. In addition, the regional charts included the patients of 18 physicians, and the rural deliveries were done by 19 FPs. The physicians were also from a variety of backgrounds.

Limitations

The main limitation of this study was its design. The study was restricted to 4 FP practice settings in southern

Alberta: 1 regional and 3 rural hospitals. Therefore, we cannot comment on the generalizability of our findings.

Further limitations relate to the retrospective chart review: definition of cases relied on data collected for clinical purposes²¹; therefore, identification of truly eligible cases is less accurate than in a prospective study, and data are less likely to be complete without the ability to seek clarification.²¹ Reporting error is also possible, as data entry into delivery records was undertaken by various medical providers. We attempted to manage these concerns by using a standardized database to collect data and having close collaboration between data abstracters to ensure data consistency.

A further unexpected limitation was that there were fewer episiotomies than expected in our study. As a result, detailed analyses of delivery and provider characteristics that contributed to differing episiotomy rates in different locations were not possible.

Owing to researcher manpower, only 10% of estimated eligible regional deliveries were reviewed, introducing the possibility of sampling bias in the regional sample. The potential for bias was reduced by random sampling of regional records by the records department independent of the researchers.

Conclusion

In our study, both rural and regional practitioners in southern Alberta performed episiotomy less frequently than provincial and national rates, thus demonstrating a “restrictive” use of the procedure in keeping with current evidence-based guidelines.^{4,9} Rural practitioners should be reassured that practice in a rural facility does not increase the likelihood of performing episiotomy, despite limited cesarean section availability or OB backup. Regional OBs performed episiotomy with around 5 times the frequency of FPs, a difference that is not accounted for by instrumentation alone.

Our small study raises a number of research questions for further detailed research. Larger prospective studies are needed to examine possible differences between FP and OB obstetric practice (eg, the differences between training or philosophy of FPs and OBs).^{16,22} Larger prospective studies would also allow detailed examination of maternal and pregnancy characteristics that might affect episiotomy and perineal tear rates. 🌿

Drs Hargrove and Penner were family medicine residents in the South Alberta Rural Residency Program at the University of Calgary when they conceived and undertook the study. They are now rural family physicians in Alberta. **Mr Williamson** is a statistician in the Department of Family Medicine at the University of Calgary. **Dr Ross** is a clinical epidemiologist and Director of Research in the Department of Obstetrics and Gynecology at the University of Calgary.

Contributors

Drs Hargrove, Penner, and Ross contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript submission. **Mr Williamson** provided statistical support for the study and contributed to preparing the manuscript submission.

Competing interests

None declared

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